

STANDARD OPERATING PROCEDURE

Title:

Surface Water Site Assessments

Identifier:

ER-SOP-2.01

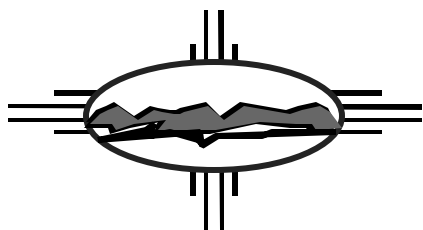
Revision:

0

Effective Date:

9/21/99

ER Catalog Number: **ER19990087**



ER PROJECT

LOS ALAMOS NATIONAL LABORATORY

Surface Water Site Assessments

Table of Contents

| | |
|--------------------------------------|---|
| 1.0 PURPOSE | 3 |
| 2.0 TRAINING | 3 |
| 3.0 DEFINITIONS | 3 |
| 4.0 BACKGROUND AND PRECAUTIONS | 5 |
| 5.0 EQUIPMENT | 5 |
| 6.0 PROCEDURE | 5 |
| 7.0 REFERENCES | 8 |
| 8.0 RECORDS | 8 |
| 9.0 ATTACHMENTS | 9 |

Surface Water Site Assessments

NOTE: Environmental Restoration (ER) Project personnel may produce paper copies of this procedure printed from the controlled-document electronic file located at <http://erinternal.lanl.gov/documents/Procedures/sops.htm>. However, it is their responsibility to ensure that they are trained to and utilizing the current version of this procedure. The Quality Program Project Leader (QPPL) may be contacted if text is unclear.

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the process for determining whether a Los Alamos National Laboratory (Laboratory) ER Project site has the potential to adversely effect surface water quality.

Note: The ER Project at the Laboratory is responsible for the investigation and remediation of solid waste management units (SWMUs) under the Resource Conservation and Recovery Act (RCRA) and areas of concern (AOCs) under the direction of the Department of Energy (DOE). During the investigation and remediation phases, information may be gathered that indicates that contaminant conditions may be present at the site that might affect surface water quality. Depending on the contaminant found, its concentration, and the erosion/sediment transport potential, it may be necessary to develop an action plan to mitigate the problem. The mitigation could include site restoration and/or stabilization.

2.0 TRAINING

- 2.1 All users of this SOP are trained by self-study, and the training is documented in accordance with QP-2.2. For consistency, Water Quality and Hydrology Group (ESH-18) personnel may be contacted for assistance.
- 2.2 The **Field Team Leader** (FTL) will monitor the proper implementation of this procedure and ensure that relevant team members have completed all applicable training assignments in accordance with QP-2.2.

3.0 DEFINITIONS

- 3.1 Area of concern (AOC) — Any suspected release of hazardous waste or hazardous waste constituent which is not directly associated with a SWMU (EPA, 1986).
- 3.2 Best Management Practices (BMPs) — BMPs mean schedules of activities, prohibition of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States.

BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw-material storage areas.

- 3.3 Canopy — The ground cover formed by the leafy upper branches of surrounding trees and shrubs.
- 3.4 Chemical of potential concern (COPC) — A chemical detected at a specific site that has the potential to adversely affect human or animal receptors due to its concentration (e.g., above regulatory screening action levels [SALs] or upper tolerance limit [UTL] values), distribution, and mechanism of toxicity. The chemical remains a concern until exposure pathways and receptors are evaluated in a site-specific risk assessment.
- 3.5 Ground cover — The covering of naturally occurring soils by either natural or man-made mechanisms (e.g., grasses, pine needles, asphalt, concrete, etc.).
- 3.6 Gully erosion — The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths, which can range from 1 ft to as much as 50 ft.
- 3.7 Potential release site (PRS) — A site suspected of releasing or having the potential to release contaminants into the environment. PRS is a generic term that includes SWMUs, hazardous-waste sites listed as Module VII of the Laboratory's Hazardous Waste Facility Permit, and sites that have been identified as potentially contaminated by radioactivity. The ER Project has the responsibility for investigating and, if necessary, cleaning up such sites on and around the Laboratory.
- 3.8 Refuse — Includes food; swill; carrion; slops; and all substances from the preparation, cooking, and consumption of food. It also includes all substances that result from the handling, storage, and sale of food products; the carcasses of animals; junked parts of automobiles and other machinery; oil; discarded furniture; paper cartons; cans; bottles; tree branches; yard trimmings; ashes; and all unwholesome material.
- 3.9 Rill erosion — An erosion process in which numerous small channels only several inches deep are formed by concentrated runoff that flows during and immediately following rain storms.
- 3.10 Runoff — The portion of the precipitation on a drainage area that is discharged from the area either by sheet flow or adjacent stream channels.
- 3.11 Run-on — Surface water flowing onto an area as a result of runoff occurring higher up the slope.
- 3.12 Slope — A slope is a ratio of units of elevation change to units of horizontal change usually expressed in degrees.

- 3.13 Solid Waste Management Unit (SWMU) — Any discernible unit where solid wastes have been or may have been placed at any time, regardless of whether the unit was intended for the management of solid or hazardous wastes. These areas include anywhere solid wastes have been routinely and systematically released. All SWMUs are listed in Module VIII of HSWA Permit.
- 3.14 Watercourse — Any river, creek, arroyo, canyon, draw, wash, or other channel that has definite banks and beds with visual evidence of occasional flow of water.
- 3.15 Water pollution — Either introducing or permitting the introduction into water, either directly or indirectly, of one or more water contaminants in such quantity and of such duration as may, with reasonable probability, injure human health, animal or plant life, or property, or to unreasonably interfere with the public welfare or the use of the property.

4.0 BACKGROUND AND PRECAUTIONS

Members of ESH-18 perform a variety of kinds of fieldwork around the Laboratory. All fieldwork conducted as part of this SOP will follow their group-specific activity hazards analysis (AHA) and additional requirements set forth by the Facility Management Unit (FMU).

5.0 EQUIPMENT

Equipment used when going into the field depends on the distance from the group office and the distance the field technician will be from the vehicle. Field personnel must have current certifications in First Aid and CPR. Additional training or specific PPE may be required; this depends on the work location. For this procedure the following equipment is needed before going into the field to perform any work:

- first aid kit in vehicle;
- radio or cellular phone communication;
- drinking water;
- camera for photodocumentation; and
- clipboard, pencils, markers, and/or white board.

6.0 PROCEDURE

Note: Deviations from SOPs are made in accordance with QP-4.2.

Streams, watercourses, and groundwater quality are regulated by the New Mexico Water Quality Control Commission (WQCC) Regulations. The water quality standards developed are enforced by the New Mexico Environment Department

(NMED) Surface and Ground Water Quality Bureaus (SWQB and GWQB, respectively) (see Attachment C for Summary Table). A surface water site assessment is made at a PRS using a checklist that has been developed to assess the erosion potential of each PRS. This evaluation checklist will aid in the prioritization of water-quality corrective actions and the BMPs necessary to protect surface water quality.

6.1 Overview Of Evaluation Process

PRSs are being investigated at the Laboratory to determine if they present a threat to human health or the environment. As information becomes available, water-quality concerns associated with a PRS may become evident. If contaminants are found to exist at the site above SALs in soil samples or above WQCC standards in surface water samples collected at the site and the topographic and vegetative state of the PRS suggests that migration of those contaminants could occur, a corrective action must be implemented.

6.2 Evaluating a PRS

The process is a two part evaluation. Apply this evaluation process to all ER Project sites that have not been recommended for “no further action” (NFA) under criteria one, two, or three as described in the April 1996, Document of Understanding (DOU). These three NFA criteria describe situations where either the site could not be located or did not exist, no waste or contamination is associated with the site, or no release to the environment from the site has occurred (e.g. the unit is inside of a building and no pathways to the environment exist, i.e., no floor drains exist).

Because of the large number of sites remaining in the project that do not fit the NFA criteria described above, sites must be prioritized for evaluation. The first sites that will be evaluated are those adjacent to drainages and canyon systems. After those are completed, evaluate the remaining sites.

6.2.1 The **ER Project** will initiate and complete Part A (see Attachment A) of the evaluation, which consists of compiling existing PRS analytical data, site maps, and knowledge of process information.

6.2.2 **ESH-18** personnel will complete Part B (see Attachment B) of the evaluation, which involves assessing the erosion/sediment transport potential at each PRS.

6.3 Implementing Corrective Actions

6.3.1 Prioritizing Evaluated PRSs for Site Actions

Parts A and B, when completed, will provide a basis for prioritizing and scheduling site actions needed to control undesirable-constituent

surface-water runoff and constituent-laden sediments that are eroding from PRSs.

6.3.1.1 A Surface Water Assessment Team (SWAT), comprised of ER Project, ESH-18, DOE Oversight Bureau (DOE-OB), NMED SWQB, and facility representatives has been formed to evaluate the completed assessments.

6.3.1.2 To ensure the worst sites are evaluated first, the **SWAT** will prioritize sites identified as having bioaccumulators present (see Attachment D for bioaccumulator list). SWAT evaluations shall use only existing information and/or data for the PRS of interest as reported in Parts A and B of the ER-SOP-2.01 site assessment (Attachments A and B). The ability of the SWAT to efficiently evaluate a site is directly dependent upon the PRS documentation to date.

6.3.1.3 For sites where the Part B, Surface Water Site Assessment, score is higher than 50, the **SWAT** will complete an evaluation to assess the site for potential contaminant migration and to prioritize potential corrective actions for the site.

6.3.1.4 For sites where the Part B, Surface Water Site Assessment, score is equal to or less than 50, no immediate action is required. This score reflects a site where there is a low potential for constituents in surface water and/or sediment to migrate off the site. These sites may not be included in a SWAT evaluation, but shall continue, as necessary, to be evaluated for other possible unacceptable environmental risks, such as human health and ecological risks.

6.3.2 Implementing Site Actions and Tracking SWAT Recommendations

6.3.2.1 Sites with COPCs present and which have high erosion potential require the **SWAT** to write a summary to the appropriate owner of the site in which the recommended corrective action is described. These corrective actions can be either minimal activities such as BMPs, which will temporarily stabilize the site until a final remedy can be applied or the final remedy itself.

6.3.2.2 Temporary solutions require routine inspection and maintenance by the **site owner** to ensure their effectiveness. Final remedies will likely be contaminant removal or the application of an engineered solution to inhibit contamination migration while protecting state waters.

6.3.2.3 Upon completion of the corrective activities at a PRS, The **ER Project** and the **FMU** will generate an NFA report that describes the results of the actions.

6.3.2.4 **ESH-18** will review these written summaries in order to ensure all water-protection requirements are satisfied.

6.3.2.5 **ESH-18** will submit copies of these final reports to NMED and DOE-OB upon completion.

6.3.3 Financial Responsibility for Corrective Actions

6.3.3.1 The **ER Project** is responsible for ensuring that historic, inactive sites do not adversely effect the state's surface water quality. The ER Project will fund all corrective actions and stormwater BMPs at those sites.

6.3.3.2 For inactive sites that have been created since 1988 and active sites that might currently be affecting water quality, the **landlord** of those sites or **Facilities, Security, and Safeguard Division** (FSS) will fund those actions. ESH-18 will coordinate the implementation of corrective actions necessary at non-ER owned sites.

7.0 REFERENCES

The following documents have been cited within this procedure.

AP-02.1, Procedure for LANL ER Records Management

QP-2.2, Personnel Orientation and Training

QP-4.2, Standard Operating Procedure Development

EPA, "RCRA Facility Assessment Guidance," (OSWER, Washington, DC, 1986).

New Mexico Water Quality Control Commission, "State of New Mexico Ground and Surface Water Quality Protection Regulations," (New Mexico Water Quality Control Commission, Santa Fe, NM, 1995).

8.0 RECORDS

The **ER Project Office** is responsible for submitting the following records (processed in accordance with AP-02.1) to the Records Processing Facility.

8.1 Completed forms identified in Section 6.0

9.0 ATTACHMENTS

The document user may employ documentation formats different from those attached to/named in this procedure—as long as the substituted formats in use provide, as a minimum, the information required in the official forms developed by the procedure.

Attachment A: Constituent Assessment Form (form and completion instructions)
(3 pages)

Attachment B: Surface Water Site Assessment (form, matrix, and completion instructions) (7 pages)

Attachment C: Table 1 - Summary of Regulatory Water Standards Used for ER Projects (5 pages)

Attachment D: Proposed ER Project Bioaccumulator List (1 page)

Constituent Assessment (Part A)

Site Information

1. PRS Number: _____ 2. Date/Time: _____
3. ER Point of Contact: _____ 4. FMU/Point of Contact: _____ / _____
5. ☐ HSWA ☐ AOC (check both if AOC is on HSWA Permit) 6. Site Ranking System (SRS) #: _____

7. Description of the historical operations of this PRS:

8. Description of the current operations of this PRS (if any):

PRS Status

9. Action/Status to Date (check all that apply) Date Completed
or Anticipated
- ☐ None
- Field Investigation ☐ Phase I ☐ Phase II _____
- Interim Measures ☐ IM ☐ BMPs _____
- Accelerated Cleanup ☐ VCA ☐ VCM _____
- Other ☐ Monitoring ☐ CMs _____
- Report Status ☐ RFI Report ☐ SAP _____
- ☐ NFA/DOU — If checked, supply criteria number(s): _____
- Comments:

Sample Information

- Y N
- ☐ ☐ 10. Have surface/sediment (depth less than 12 in.) samples been collected that reflect current site conditions?
- If yes: 1) Attach data.
2) Include analyte name, value, units, location ID, sample ID, SAL, depth, and media (soil, tuff, etc.).
3) Please attach existing map that shows where samples were taken, if available.
- ☐ ☐ 11. Have surface water samples been collected that reflect site conditions?
- If yes: 1) Attach data.
2) Include analyte name, value, units, location ID, filtered/nonfiltered, and flow data (if available).
3) Please attach existing map that shows where samples were taken, if available.
- ☐ ☐ 12. Is data pending? If yes: 1) List date data are anticipated: _____
2) Provide a list of COPCs identified in RFI Work Plan as an attachment.

13. ER Representative: _____
(Print name and title, then sign)

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Instructions for Completing a Constituent Assessment Form (Part A)

Part A of the procedure addresses both current and historic Laboratory operations that are known to have occurred at the PRS, the potential or probable constituents of concern for this PRS, and the status of work or actions taken at the PRS.

Completion of Part A shall use only existing information and/or data that are available for the PRS of interest. The form itself may be completed electronically or manually by attaching the historic and current operations description from an RFI work plan or RFI Report. Available data tables may be copied from a work plan/report or queried from Facility for Information, Management, Analysis and Display (FIMAD) but should be submitted as an attachment to the completed form. The ability to efficiently complete Part A is directly dependent upon the knowledge about the PRS of interest and the PRS documentation to date.

The FTL is responsible for the initiation and completion of the constituent-assessment process. Use an indelible dark-ink pen. Make an entry in each blank. For entry blanks for which no data are obtained, enter “UNK” for unknown, “N/A” for not applicable, or “ND” for not done, as appropriate. To change an entry, draw a single line through it, add the correct information above it, and date and initial the change. For all forms, complete the following information:

Site Information:

1. PRS Number — Use the PRS identification assigned by the ER Project for each site. If a map of the PRS and adjacent buildings within the Technical Area (TA) is available, please attach to Part A form.
2. Date/Time — The date and time when the measurement was made, in the following formats: DD-MMM-YY (e.g., 01-JAN-91) and the 24-hour clock time (0837 for 8:37 a.m. and 1912 for 7:12 p.m.).
3. ER Point of Contact — Provide the name of the individual who completed Part A or another individual who is very knowledgeable about the site and the information/data requested for Part A.
4. Facility Management Unit (FMU)/Responsible Party Contact — Provide the name of the individual who represents the facility where the PRS is located, and when coordination is necessary, is the point of contact for complying with Laboratory safety, security, or work-activity restrictions for the PRS.
5. Permit Information — Is this PRS listed on the Module VIII or is it an Area Of Concern (AOC) (potentially on the permit also)?
6. Site Ranking System Score — Provide the SRS score for this PRS from the most recent site ranking.
7. Description of the historic operations of this PRS — Provide information regarding past site activities that may typically be found in the SWMU report, an RFI work plan and/or RFI report. Include the identification of all constituents used at the PRS

as raw materials, known constituent product intermediates and product constituents for other known processes. If available, attach previous information not collected by the ER Project to Part A.

8. Description of current operations of this PRS (if any): Provide information regarding present site activities that may typically be found in the SWMU report, an RFI work plan and/or report or the current facility manager. Include the identification of all constituents used at the PRS as raw materials, known constituent-product intermediates and product constituents for other known processes. If information is available about these operations, attach the information to Part A.

PRS Status:

9. Action/Status to Date — Provide information on what type of field action has been proposed, completed, or is ongoing at a PRS. Also, provide information on the report/plan status of the site (e.g. RFI Work Plan, Sampling Analysis Plan, etc.). Check the appropriate fields on the form and provide the date that the action was completed or is anticipated to be completed. Provide additional information by circling the appropriate action (e.g., Phase I, under Field Investigation), or in the comment field.

Sample Information:

10. Soil/sediment sample descriptor information and sample data — Provide information/data that reflect only current ambient PRS field conditions which are above detection limits or background UTL values. Do not provide information/data with regard to past site conditions that no longer exist due to an action that has been taken at the PRS. Information/data are only for surface soils and sediments of less than 12 in. in depth.

Provide additional information to support PRS data, (e.g., sample date; sample number; sample location coordinates' site map with sample locations; media — soil, sediment, tuff, etc.; data qualifiers; SALs; data detection/reporting limits; and supporting background data for the media where data is available). Editing or screening the data is not necessary at this time. All data that are available that meet the above specified identifiers should be reported.
11. Surface water sample descriptor information — If surface water sample information is available, provide information regarding sample date, location, whether sample was filtered/nonfiltered, and flow information if available. If surface water samples represent runoff from more than one PRS, the other involved PRSs and their constituents must also be identified.
12. If samples have been collected but data are not available, provide the anticipated date when the data could be available. Attach knowledge of process COPCs from RFI work plan.
13. ER Representative Identification — Print your name and position title, then sign.

Surface Water Site Assessment (Part B)

Page 1 of 3

Site Information:

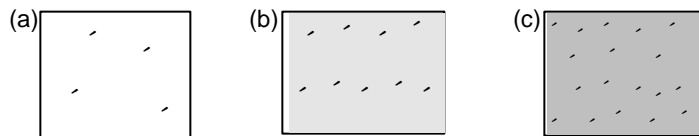
1a. PRS Number: _____ 1b. Structure Number: _____ 1c. FMU Number: _____
 2. Date/Time: _____

Site Setting (check all that apply):

3. ☐ On mesa top (a). ☐ In the canyon floor, but not in an established channel (c).
☐ Within a bench of a canyon (b). ☐ Within an established channel in the canyon floor (d).

Explanation:

4. Estimated ground and/or canopy cover at site(deciduous leaves, pine needles, rocks, vegetation, trees, structures, asphalt, etc.):



Estimated percentage of ground/canopy cover: ☐ 0% to 25% ☐ 25% to 75% ☐ 75% to 100%

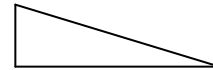
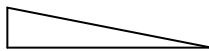
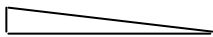
Explanation:

5. Steepest slope at the impacted area:

(a)

(b)

(c)



☐ Less than 10%

☐ 10% to 30%

☐ 30% and greater

Explanation:

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Surface Water Site Assessment (Part B)

Page 2 of 3

Runoff Factors:

Y N

☐ ☐ 6. Is there visible evidence of runoff discharging from the site? (If yes, answer questions 6a–6c below.)

☐ ☐ 6a. Is runoff channelized? If yes, describe: ☐ Man-made channel ☐ Natural channel

Explanation:

6b. Where does evidence of runoff terminate?

☐ Drainage or wetland (name) _____

☐ Within bench of canyon setting (name) _____

☐ Other (i.e., retention pond, meadow, mesa top) _____

Explanation:

☐ ☐ 6c. Has runoff caused visible erosion at the site? If yes, check type and explain below. ☐ Sheet ☐ Rill ☐ Gully

Explanation:

Run-on Factors:

Please rate the potential for stormwater to run onto this site (check either Item 7 or Item 9):

Y N

☐ ☐ 7. Are structures (i.e., buildings, roof drains, parking lots, storm drains) creating run-on to the site?

Explanation:

☐ ☐ 8. Are current operations (i.e., fire hydrants, NPDES outfalls) adversely impacting run-on to the site?

Explanation:

☐ ☐ 9. Are natural drainage patterns directing stormwater onto the site?

Explanation:

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Surface Water Site Assessment (Part B)

Page 3 of 3

Assessment Finding:

Y N

- ☐ ☐ 10. Based on the criteria above and the assessment of this site, does a soil-erosion potential exist?
(Refer to erosion-potential matrix)

11. Signature:

Water Quality/Hydrology Representative

Initials of the independent reviewer

Check here when the information is entered in the database: ☐

This section is for ESH-18 notes, recommendations, and photographs.

Y N

- ☐ ☐ 12a. Is there visible trash/debris on the site?
- ☐ ☐ 12b. Is there visible trash/debris in the watercourse?
- 13a. Description of existing BMPs:

- ☐ ☐ 13b. Are BMPs being properly maintained? Provide description in "Other Internal Notes."

Other Internal Notes:

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Instructions for Completing a Surface Water Site Assessment Form (Part B)

ESH-18 or ER Project Regulatory Compliance personnel will complete Part B, the Surface Water Site Assessment. Part B addresses erosion potential and is part of a systematic approach to quantify surface-water impacts at Laboratory sites. This procedure describes the process for determining whether a site has the potential to adversely affect surface-water quality by erosion from run-off.

Field teams from ESH-18 or the ER Project will evaluate the field conditions to determine the potential for erosion or sediment migration. Based on the results of field evaluation, surface water corrective actions (BMPs) and/or NMED notifications may be required.

Photographs will be taken to help document the field characteristics at some sites. A consideration of the visual site conditions is necessary to accurately provide a frame of reference for the site. Photographs are taken to visually enhance the field-site condition descriptions.

Use an indelible dark-ink pen. Make an entry in each blank. For entry blanks for which no data are obtained, enter "UNK" for unknown, "N/A" for not applicable, or "ND" for not done, as appropriate. To change an entry, draw a single line through it, add the correct information above it, and date and initial the change. For all forms, complete the following information:

Site Information:

- 1a. PRS Number — Use the PRS identification assigned by the ER Project to the site.
- 1b. Structure Number — Provide the nearest technical area/structure number.
- 1c. FMU Number — Provide the facility management unit number.
2. Date/Time — The date and time when the measurement was made, in the following formats: DD-MMM-YY (e.g., 01-JAN-91) and the 24-hour clock time (0837 for 8:37 a.m. and 1912 for 7:12 p.m.).

Site Setting:

3. Check the appropriate setting(s) that best describes the location, in order of increasing concern, for the listed site.
 - (a) Check "On mesa top" if site is situated on a defined mesa top (e.g., Three Mile Mesa).
 - (b) Check "Within a bench in a canyon" if site is located over the edge of a mesa top and is either on a defined slope or bench (the original source may be located on mesa top).

- (c) Check “In the canyon floor, but not in an established channel” if site is located in the bottom of the canyon exclusive of a defined drainage or bench setting. (A drainage is defined as having a bank and channel).
- (d) Check “Within established channel in the canyon floor” if site is located in the defined drainage portion of the canyon channel. (A drainage is defined as having a bank and channel).

An explanation box is provided for a description of particular circumstances/situations. Where more than one setting is checked, the most conservative will be used in scoring this criterion on the matrix. An example would be where a septic tank was located on a mesa top (a), but the outfall from the septic discharges over the mesa onto a defined slope or bench (b), the more conservative setting (b) would be used.

4. Check the appropriate percentage of canopy and ground cover that best compares with the provided pictorial illustration for the site location.
 - Check from 0% to 25% if ground/canopy cover at site visually compares best with example (a).
 - Check 25% to 75% if ground/canopy cover at site visually compares best with example (b).
 - Check greater than 75% if ground/canopy cover at site visually compares best with example (c).

An explanation box is provided to describe the type(s) of ground cover (e.g., pine needles, grass, asphalt, rock, etc.) and canopy cover (e.g., pine/juniper, deciduous/evergreen) observed at the site. Where more than one percentage is checked, the most conservative will be used in scoring this criterion on the matrix. An example would be where a septic tank was located in a densely vegetated area (c), but the outfall from the septic discharges over the mesa top into a less vegetated area (b), the most conservative coverage (b) would be used

5. Check the appropriate slope(s) that best compare with the provided pictorial illustration for the site location.
 - Check less than 10% if slope at site visually compares to example (a).
 - Check 10% to 30% if slope at site visually compares to example (b).
 - Check greater than 30% if slope at site visually compares to example (c).

An explanation box is provided to describe particular circumstances/situations. Where more than one slope steepness is checked, the most conservative will be used in scoring the criteria. An example would be where a septic tank was located on a mesa top (a), but the outfall from the septic discharges over the mesa onto a very steep slope (c), the most conservative slope (c) would be used.

Runoff Factors:

6. Is there visible evidence of water and/or sediment discharging from PRS? *If yes*, complete parts a, b, and c. *If no*, proceed to question number 7.
- 6a. Is runoff channelized? Check whether runoff discharges through man-made or natural drainage channels or from sheet flow. An explanation box is provided to describe the type of discharge.
- 6b. Where does evidence of runoff terminate? Check whether visual evidence of runoff terminates into a known canyon (e.g., Pajarito), into a known sub-drainage or wetland, or into other flat lying areas (e.g., bench setting, meadows, detention ponds, etc.). If runoff can be traced to an observable endpoint or drainage, provide an adequate description of that location.
- 6c. Has runoff caused visible erosion at the PRS? If yes, check sheet, rill, or gully erosion. An explanation box is provided to describe the visible signs of erosion and to provide an indication of the potential for the movement of surface sediments from the site.

Run-on Factors:

7. Are structures (i.e., buildings, roof drains, parking lots) creating run-on to this PRS?

If structures, from existing or new construction for facilities, collect and/or divert storm water run-on onto the PRS being evaluated, check yes. An explanation box is provided to describe the potential for buildings, roof drains, and/or construction project sites larger than five acres, to increase the volume of run-on to the site.
8. Are current operations adversely impacting storm water run-on to the PRS?

If current operations (e.g., NPDES outfalls, salvage material storage areas, septic discharges) could adversely impact run-on to the site being evaluated, check yes. Nonstormwater discharges such as fire-protection devices, potable-water-system tank overflow, and dust-suppression activities are also of interest. An explanation box is provided to describe which operations may be impacting run-on.
9. Are natural drainage patterns directing stormwater onto the PRS?

If site is located in an area in which natural drainage patterns focus stormwater run-on onto a site, check yes. An explanation box is provided to describe the natural drainage that could potentially cause erosion.

Typically, either question 7 or 9 would be selected independent of one another. If both are selected, then only one will be rated in the matrix because the weighting is identical.

Assessment Finding:

- 10 Based on the above criteria and the assessment of the site, does soil-erosion potential exist?

This is a subjective decision made by the field technician based on the evidence found at the site. The “potential” for soil erosion may exist without visible evidence of erosion being observed on the day of the assessment.

Signature:

11. Name of Water Quality/Hydrology or ER Project Representative — Provide name of person who completed the surface water site assessment for this site as a representative of ESH-18 or the ER Project. After completion, provide a copy to the appropriate representatives for the site.

ESH-18 Notes and Recommendations:

- 12a. Is there visible trash/debris located on site? If trash/debris is observed at the site, check yes and provide comments in “Other Internal Notes.”
- 12b. Is there visible trash/debris in a watercourse? If trash/debris is observed within a watercourse as defined earlier in Section 3.15, check yes and provide comments in “Other Internal Notes”.
- 13a. Description of existing BMPs. Provide a brief description of BMPs that currently exist at the site.
- 13b. Are BMPs being properly maintained? Check either yes/no and provide a description of the effectiveness or ineffectiveness of BMPs in “Other Internal Notes.”

Summary of Regulatory Water Standards Used for ER Projects^a

| Analyte Code ^b | Chemical ^c | Drinking Water Standards | | NMED ^d WQCC ^e Surface Water Standards | | | NMED WQCC Groundwater Standards | | |
|---------------------------|---|--------------------------------|------------------------------|---|--|--------------------------------------|----------------------------------|---|------------------------------------|
| | | US EPA MCL ^f (µg/l) | NMED MCL ^g (µg/l) | Domestic Water Supply ^h (µg/l) | Livestock Watering ⁱ (µg/l) | Wildlife Habitat ^j (µg/l) | Human Health ^k (µg/l) | Domestic Water Supply ^k (µg/l) | Irrigation Use ^k (µg/l) |
| 15972-60-8 | Alachlor | 2.0E+00 | 2.0E+00 | — ^m | — | — | — | — | — |
| Al | Aluminum | 5.0E+01 ⁿ | — | — | 5.0E+03 | — | — | — | 5.0E+03 |
| Sb | Antimony | 6.0E+00 | 6.0E+00 | — | — | — | — | — | — |
| As | Arsenic (cancer endpoint) | 5.0E+01 | 5.0E+01 | 5.0E+01 | 2.0E+02 | — | 1.0E+02 | — | — |
| 1912-24-9 | Atrazine | 3.0E+00 | 3.0E+00 | — | — | — | — | — | — |
| Ba | Barium | 2.0E+03 | 2.0E+03 | 1.0E+03 | — | — | 1.0E+03 | — | — |
| 71-43-2 | Benzene | 5.0E+00 | 5.0E+00 | — | — | — | 1.0E+01 | — | — |
| 50-32-8 | Benzo[a]pyrene | 2.0E-01 | 2.0E-01 | — | — | — | 7.0E-01 | — | — |
| Be | Beryllium | 4.0E+00 | 4.0E+00 | — | — | — | — | — | — |
| 117-81-7 | Bis(2-ethylhexyl)phthalate (DEHP) (Di[ethylhexyl]phthalate) | 6.0E+00 | 6.0E+00 | — | — | — | — | — | — |

^a Compiled on 01/06/97 by Linda Nonno (665-0725, lnonno@lanl.gov). **Note: Values in this table are subject to change.** Verify that you are using current values by checking the ER Project web site before use (<http://erinternal.lanl.gov>).

^b In order to enable joining in the FIMAD database, analyte codes replace CAS numbers for metals, radionuclides, and ions.

^c Chemicals include inorganics, high explosives, and organic compounds (volatile and semivolatile organic compounds, pesticides, and polychlorinated biphenyls).

^d New Mexico Environment Department

^e Water Quality Control Commission

^f Maximum Contaminant Level (MCL) concentration from "Drinking Water Regulations and Health Advisories," October 1996, US Environmental Protection Agency (EPA) Office of Water, Washington, DC. (EPA 1996,1380).

^g Maximum Contaminant Level (MCL) concentration from "Drinking Water Regulations," Title 20, Chapter 7, Part 1, NMED Drinking Water Bureau, January 1995, Santa Fe, NM (State of New Mexico 1995,1268).

^h Domestic Water Supply Standard from "Standards for Interstate and Intrastate Streams" (i.e., New Mexico surface water standards for domestic water supply), Title 20, Chapter 6, Part I, NMED WQCC, January 1995, Santa Fe, NM (State of New Mexico 1995,1267). Based on the dissolved (i.e., filtered) portion with the exception of mercury, For radium-226 + radium-228, tritium, and gross alpha, the standard is based on the total (i.e., nonfiltered) portion.

ⁱ Livestock Watering Standard from "Standards for Interstate and Intrastate Streams," Title 20, Chapter 6, Part 1, NMED WQCC, January 1995, Santa Fe, NM (State of New Mexico 1995,1264). Based on the dissolved (i.e., filtered) portion of water samples for inorganic chemicals with the exception of mercury.

^j Wildlife Habitat Standard from "Standards for Interstate and Intrastate Streams," Title 20, Chapter 6, Part 1, NMED WQCC, January 1995, Santa Fe, NM (State of New Mexico 1995,1267). Based on total (i.e., nonfiltered) recoverable selenium and total mercury.

^k Groundwater standard from "New Mexico Water Quality Control Commission Regulations,," Title 20, Chapter 6, Part 2, NMED WQCC, December 1995, Santa Fe, NM (State of New Mexico 1995,1318). Based on dissolved (i.e., filtered) portion with the exception of mercury, organic chemicals, and nonaqueous phase liquids (such as oil).

^m "—" = no standard.

ⁿ US EPA Secondary Maximum Contaminant Level (SMCL) concentration from "Drinking Water Regulations and Health Advisories," May 1995, US EPA Office of Water Washington, DC (EPA 1996,1380).

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Summary of Regulatory Water Standards Used for ER Projects (continued)

| Analyte Code | Chemical | Drinking Water Standards | | NMED WQCC Surface Water Standards | | | NMED WQCC Groundwater Standards | | |
|--------------|---|--------------------------|----------------------|-----------------------------------|---------------------------|-------------------------|---------------------------------|------------------------------|-----------------------|
| | | US EPA MCL (µg/l) | NMED MCL (µg/l) | Domestic Water Supply (µg/l) | Livestock Watering (µg/l) | Wildlife Habitat (µg/l) | Human Health (µg/l) | Domestic Water Supply (µg/l) | Irrigation Use (µg/l) |
| B | Boron | — | — | — | 5.0E+03 | — | — | — | 7.5E+02 |
| Cd | Cadmium | 5.0E+00 | 5.0E+00 | 1.0E+01 | 5.0E+01 | — | 1.0E+01 | — | — |
| 1563-66-2 | Carbofuran | 4.0E+01 | 4.0E+01 | — | — | — | — | — | — |
| 56-23-5 | Carbon Tetrachloride | 5.0E+00 | 5.0E+00 | — | — | — | 1.0E+01 | — | — |
| 57-74-9 | Chlordane | 2.0E+00 | 2.0E+00 | — | — | — | — | — | — |
| Cl(-1) | Chloride | 2.5E+05 ⁿ | — | — | — | — | — | 2.5E+05 | — |
| 108-90-7 | Chlorobenzene (Monochlorobenzene) | 1.0E+02 | 1.0E+02 | — | — | — | — | — | — |
| 67-66-3 | Chloroform (Trichloromethane) | 1.0E+02 ^o | 1.0E+02 ^o | — | — | — | 1.0E+02 | — | — |
| Cr | Chromium (must include both trivalent and hexavalent forms) | 1.0E+02 | 1.0E+02 | 5.0E+01 | 1.0E+03 | — | 5.0E+01 | — | — |
| Co | Cobalt | — | — | — | 1.0E+03 | — | — | — | 5.0E+01 |
| Cu | Copper | 1.3E+03 ^p | 1.3E+03 ^p | — | 5.0E+02 | — | — | 1.0E+03 | — |
| Cn(-1) | Cyanide | 2.0E+02 | 2.0E+02 | 2.0E+02 | — | — | 2.0E+02 | — | — |
| 75-99-0 | Dalapon | 2.0E+02 | 2.0E+02 | — | — | — | — | — | — |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 2.0E-01 | 2.0E-01 | — | — | — | — | — | — |
| 106-93-4 | 1,2-Dibromoethane (Ethylene Dibromide) | 5.0E-02 | 5.0E-02 | — | — | — | 1.0E-01 | — | — |
| 95-50-1 | 1,2-Dichlorobenzene(o) | 6.0E+02 | 6.0E+02 | — | — | — | — | — | — |
| 541-73-1 | 1,3-Dichlorobenzene(m) | 6.0E+02 | — | — | — | — | — | — | — |
| 106-46-7 | 1,4-Dichlorobenzene(p) | 7.5E+01 | 7.5E+01 | — | — | — | — | — | — |
| 75-34-3 | 1,1-Dichloroethane | — | — | — | — | — | 2.5E+01 | — | — |
| 107-06-2 | 1,2-Dichloroethane (EDC) | 5.0E+00 | 5.0E+00 | — | — | — | 1.0E+01 | — | — |
| 75-35-4 | 1,1-Dichloroethylene (1,1-DCE) | 7.0E+00 | 7.0E+00 | — | — | — | 5.0E+00 | — | — |
| 156-59-2 | 1,2-Dichloroethylene (cis) | 7.0E+01 | 7.0E+01 | — | — | — | — | — | — |
| 156-60-5 | 1,2-Dichloroethylene (trans) | 1.0E+02 | 1.0E+02 | — | — | — | — | — | — |
| 94-75-7 | 2,4-Dichlorophenoxyacetic Acid | 7.0E+01 | 7.0E+01 | — | — | — | — | — | — |

ⁿ US EPA Secondary Maximum Contaminant Level (SMCL) concentration from "Drinking Water Regulations and Health Advisories," May 1995, US EPA Office of Water Washington, DC (EPA 1996,1380).

^o The State (State of New Mexico 1995, 1268) and EPA (EPA 1996, 1380) MCL for chloroform is the MCL for total trihalomethanes. Total trihalomethanes is defined as the sum of the concentration of the following trihalomethane compounds: chloroform, dibromochloromethane, bromodichloromethane, and tribromomethane (bromoform).

^p US EPA MCL is under review (EPA 1996,1380). Number presented is the EPA action level. Although the EPA MCL is under review, to NMED Drinking Water Bureau has adopted the action level.

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Summary of Regulatory Water Standards Used for ER Projects (continued)

| Analyte Code | Chemical | Drinking Water Standards | | NMED WQCC Surface Water Standards | | | NMED WQCC Groundwater Standards | | |
|----------------------------------|--------------------------------------|--------------------------|----------------------|-----------------------------------|---------------------------|-------------------------|---------------------------------|------------------------------|-----------------------|
| | | US EPA MCL (µg/l) | NMED MCL (µg/l) | Domestic Water Supply (µg/l) | Livestock Watering (µg/l) | Wildlife Habitat (µg/l) | Human Health (µg/l) | Domestic Water Supply (µg/l) | Irrigation Use (µg/l) |
| 78-87-5 | 1,2-Dichloropropane | 5.0E+00 | 5.0E+00 | — | — | — | — | — | — |
| 103-23-1 | Di(2-ethylhexyl)adipate | 4.0E+02 | 4.0E+02 | — | — | — | — | — | — |
| 88-85-7 | Dinoseb | 7.0E+00 | 7.0E+00 | — | — | — | — | — | — |
| 85-00-7 | Diquat | 2.0E+01 | 2.0E+01 | — | — | — | — | — | — |
| 145-73-3 | Endothall | 1.0E+02 | 1.0E+02 | — | — | — | — | — | — |
| 72-20-8 | Endrin | 2.0E+00 | 2.0E+00 | — | — | — | — | — | — |
| 100-41-1 | Ethylbenzene | 7.0E+02 | 7.0E+02 | — | — | — | 7.5E+02 | — | — |
| F(-1) | Fluoride | 4.0E+03 ⁿ | 4.0E+03 | — | — | — | 1.6E+03 | — | — |
| 1071-83-6 | Glyphosate | 7.0E+02 | 7.0E+02 | — | — | — | — | — | — |
| 76-44-8 | Heptachlor | 4.0E-01 | 4.0E-01 | — | — | — | — | — | — |
| 1024-57-3 | Heptachlor epoxide | 2.0E-01 | 2.0E-01 | — | — | — | — | — | — |
| 118-74-1 | Hexachlorobenzene | 1.0E+00 | 1.0E+00 | — | — | — | — | — | — |
| 58-89-9 | HCH (gamma) Lindane | 2.0E-01 | 2.0E-01 | — | — | — | — | — | — |
| 77-47-4 | Hexachlorocyclopentadiene | 5.0E+01 | 5.0E+01 | — | — | — | — | — | — |
| Fe | Iron | 3.0E+02 ⁿ | — | — | — | — | 1.0E+03 | — | — |
| Pb | Lead | 1.5E+01 ^p | 1.5E+01 ^p | 5.0E+01 | 1.0E+02 | — | 5.0E+01 | — | — |
| Mn | Manganese | 5.0E+01 ⁿ | — | — | — | — | — | 2.0E+02 | — |
| Hg | Mercury (inorganic) | 2.0E+00 | 2.0E+00 | 2.0E+00 | 1.0E+01 | 1.2E+02 | 2.0E+00 | — | — |
| 72-43-5 | Methoxychlor | 4.0E+01 | 4.0E+01 | — | — | — | — | — | — |
| 75-09-2 | Methylene Chloride (Dichloromethane) | 5.0E+00 | 5.0E+00 | — | — | — | 1.0E+02 | — | — |
| Mo | Molybdenum | — | — | — | — | — | — | — | 1.0E+03 |
| n/a ^q | Naphthalene + monomethylnaphthalenes | — | — | — | — | — | 3.0E+01 | — | — |
| Ni | Nickel (soluble salts) | — | 1.0E+02 | — | — | — | — | — | 2.0E+02 |
| NO ₃ (-1) | Nitrate (as N) | 1.0E+04 | 1.0E+04 | 1.0E+04 | — | — | 1.0E+04 | — | — |
| NO ₂ /NO ₃ | Total Nitrate + Nitrate (as N) | 1.0E+04 | 1.0E+04 | — | — | — | — | — | — |

ⁿ US EPA Secondary Maximum Contaminant Level (SMCL) concentration from "Drinking Water Regulations and Health Advisories," May 1995, US EPA Office of Water Washington, DC (EPA 1996,1380).

^p US EPA MCL is under review (EPA 1996,1380). Number presented is the EPA action level. Although the EPA MCL is under review, to NMED Drinking Water Bureau has adopted the action level.

^q n/a = not applicable

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Summary of Regulatory Water Standards Used for ER Projects (continued)

| Analyte Code | Chemical | Drinking Water Standards | | NMED WQCC Surface Water Standards | | | NMED WQCC Groundwater Standards | | |
|----------------------|---|--------------------------|-----------------|-----------------------------------|---------------------------|-------------------------|---------------------------------|------------------------------|-----------------------|
| | | US EPA MCL (µg/l) | NMED MCL (µg/l) | Domestic Water Supply (µg/l) | Livestock Watering (µg/l) | Wildlife Habitat (µg/l) | Human Health (µg/l) | Domestic Water Supply (µg/l) | Irrigation Use (µg/l) |
| NO ₂ (-1) | Nitrite (as N) | 1.0E+03 | 1.0E+03 | — | — | — | — | — | — |
| 23135-22-0 | Oxamyl | 2.0E+02 | 2.0E+02 | — | — | — | — | — | — |
| 87-86-5 | Pentachlorophenol | 1.0E+00 | 1.0E+00 | — | — | — | — | — | — |
| pH | pH | 6.5–8.5 pH ⁿ | — | — | — | — | — | — | — |
| n/a ^q | Phenols (Total of all phenol cmpds) | — | — | — | — | — | — | 5.0E+00 | — |
| 1918-02-1 | Picloram | 5.0E+02 | 5.0E+02 | — | — | — | — | — | — |
| 1336-36-3 | Polychlorinated biphenyls (PCBs) | 5.0E-01 | 5.0E-01 | — | — | — | 1.0E+00 | — | — |
| Se | Selenium | 5.0E+01 | 5.0E+01 | 5.0E+01 | 5.0E+01 | 2.0E+00 | 5.0E+01 | — | — |
| Ag | Silver | 1.0E+02 ⁿ | — | 5.0E+01 | — | — | 5.0E+01 | — | — |
| 122-34-9 | Simazine | 4.0E+00 | 4.0E+00 | — | — | — | — | — | — |
| SO ₄ | Sulfate | 2.5E+05 ⁿ | — | — | — | — | — | 6.0E+05 | — |
| 100-42-5 | Styrene | 1.0E+02 | 1.0E+02 | — | — | — | — | — | — |
| 1746-01-6 | 2,3,7,8-TCDD (Dioxin) | 3.0E-05 | 3.0E-05 | — | — | — | — | — | — |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | — | — | — | — | — | 1.0E+01 | — | — |
| 127-18-4 | Tetrachloroethylene (PCE) | 5.0E+00 | 5.0E+00 | — | — | — | 2.0E+01 | — | — |
| Tl | Thallium | 2.0E+00 | 2.0E+00 | — | — | — | — | — | — |
| 108-88-3 | Toluene | 1.0E+03 | 1.0E+03 | — | — | — | 7.5E+02 | — | — |
| TDS | Total Dissolved Solids | 5.0E+05 ⁿ | — | — | — | — | — | 1.0E+06 | — |
| 8001-35-2 | Toxaphene | 3.0E+00 | 3.0E+00 | — | — | — | — | — | — |
| 120-82-1 | 1,2,4-Trichlorobenzene | 7.0E+01 | 7.0E+01 | — | — | — | — | — | — |
| 71-55-6 | 1,1,1-Trichloroethane | 2.0E+02 | 2.0E+02 | — | — | — | 6.0E+01 | — | — |
| 79-00-5 | 1,1,2-Trichloroethane | 5.0E+00 | 5.0E+00 | — | — | — | 1.0E+01 | — | — |
| 79-01-6 | Trichloroethylene (TCE) | 5.0E+00 | 5.0E+00 | — | — | — | 1.0E+02 | — | — |
| 93-72-1 | 2-(2,4,5-Trichlorophenoxy)propionic Acid (2,4,5-TP) | 5.0E+01 | 5.0E+01 | — | — | — | — | — | — |
| U ^{SOLUBLE} | Uranium (soluble salts) | — | — | 5.0E+03 | — | — | 5.0E+03 | — | — |
| V | Vanadium | — | — | — | 1.0E+02 | — | — | — | — |
| 75-01-4 | Vinyl Chloride | 2.0E+00 | 2.0E+00 | — | — | — | 1.0E+00 | — | — |

ⁿ US EPA Secondary Maximum Contaminant Level (SMCL) concentration from "Drinking Water Regulations and Health Advisories," May 1995, US EPA Office of Water Washington, DC (EPA 1996,1380).

^q n/a = not applicable

ER-SOP-2.01, R0

Los Alamos
Environmental Restoration Project

Summary of Regulatory Water Standards Used for ER Projects (concluded)

| Analyte Code | Chemical | Drinking Water Standards | | NMED WQCC Surface Water Standards | | | NMED WQCC Groundwater Standards | | |
|---|--|---------------------------|---------------------------|-----------------------------------|---------------------------|-------------------------|---|------------------------------|-----------------------|
| | | US EPA MCL (µg/l) | NMED MCL (µg/l) | Domestic Water Supply (µg/l) | Livestock Watering (µg/l) | Wildlife Habitat (µg/l) | Human Health (µg/l) | Domestic Water Supply (µg/l) | Irrigation Use (µg/l) |
| 1330-20-7 | Xylene (mixed) | 1.0E+04 | 1.0E+04 | — | — | — | 6.2E+02 | — | — |
| Zn | Zinc | 5.0E+03 ⁿ | — | — | 2.5E+04 | — | — | 1.0E+04 | — |
| ALPHA | Gross Alpha (Does not include Radon or Uranium.) | 1.5E+01 | 1.5E+01 | 1.5E+01 | 1.5E+01 | — | — | — | — |
| ^{226/228} Ra | Radium-226 + Radium-228 | 5.0E+00 | 5.0E+00 | 3.0E+01 | .0E+01 | — | .0E+01 | — | — |
| ⁹⁰ Sr | Strontium-90 | — | 8.0E+00 | — | — | — | — | — | — |
| U | Uranium (radionuclide) | 2.0E+01 µg/l ^f | sect. 207(b) ^f | — | — | — | — | — | — |
| ³ H | Tritium | — | 2.0E+04 | 2.0E+04 | 2.0E+04 | — | — | — | — |
| ^f Maximum Contaminant Level (MCL) concentration from “Drinking Water Regulations and Health Advisories,” October 1996, US Environmental Protection Agency (EPA) Office of Water, Washington, DC. (EPA 1996,1380). ⁿ US EPA Secondary Maximum Contaminant Level (SMCL) concentration from “Drinking Water Regulations and Health Advisories,” May 1995, US EPA Office of Water Washington, DC (EPA 1996,1380). ^r Proposed US EPA MCL (EPA 1996,1380). Number presented is the EPA action level. | | | | | | | | | |
| ER-SOP-2.01, R0 | | | | | | | Los Alamos Environmental Restoration Project | | |

ER Project List of Potential Bioaccumulation Compounds

The priority list of compounds with a potential for bioaccumulation at the Laboratory is provided with the stipulation that the list is still under development. Compounds are being evaluated based on

- 1) toxicity,
- 2) frequency of occurrence at the Laboratory including the use of the co-occurrence of a bioaccumulator with another chemical as a marker for the bioaccumulator when supported by historical data or site sampling data,
- 3) potential for receptors including sensitive species and habitat at the Laboratory, and
- 4) bioconcentration factor (BCF) adjusted for environmental factors at the Laboratory or based on site-specific data.

Use the following list of compounds—currently in the category of “high priority” bioaccumulators—in assessing SOP 2.01 concerns at the Laboratory.

- Cadmium
- Cesium-137
- Mercury
- Strontium-90
- All arochlors (PCBs)